

molecular biology are addressed, including protein and nucleic acid structure, DNA replication, transcription, translation, prokaryotic and eukaryotic regulation, mechanisms of exchange of genetic material, and recombinant DNA technology.

**BIOL 242. Techniques in Protein Purification and Analysis (3)**  
(Same as CHEM 242.) Prerequisite: CHEM 151 or 156 or permission of instructor. Corequisite: BIOL/CHEM 241A. Deals with the technologies relevant to protein isolation, purification, analysis, immobilization, and modification in micro and macro quantities. (1 lecture, 6 lab hours)

**BIOL 243. Nucleic Acid Technology Lab (3)**  
(See CHEM 243.) Prerequisites: BIOL/CHEM 241A and 242. Corequisite: BIOL/CHEM 241B. A lecture/laboratory course focusing on the technologies used in nucleic acid chemistry, such as synthesis, translation, mutagenesis, and genetic engineering. (1 lecture, 6 lab hours)

**BIOL 244. Cell Culture Techniques (3)**  
(Same as CHEM 244.) Prerequisite: BIOL 103 and 104. The theory and practice of the *in vitro* propagation of eukaryotic cells, including growth characteristics, metabolic requirements, genetic analysis, and screening assays. Special focus is placed on cancer cell lines with the potential for stem cell manipulation relative to cultured cell biology culture and application to biotechnology. (1 lecture, 6 lab hours)

**BIOL 245. Industrial Biotechnology (3)**  
(Same as CHEM 245.) Prerequisites: MICRO 140 and CHEM 150 or 155, or permission of instructor. Theory and current practices of bioprocessing, including hands-on experience with standard techniques and formulation of a strategic plan for a new technology or product. (2 lecture, 3 lab hours) (Formerly BIOL 189T)

**BIOL 248. Seminar in Molecular Biology and Biotechnology (1-2; max total 4)**  
(See CHEM 248.) Prerequisite: admission to the biology or chemistry graduate program. Preference will be given to students enrolled in the Master of Biotechnology or Biotechnology Certificate programs. Reviews and reports on current literature in various aspects of biotechnology and molecular biology.

**BIOL 250. Scientific Research Reporting (2)**  
Prerequisite: permission of instructor. Techniques of scientific photography and writing, illustrating emphasized. (1 lecture, 3 lab hours)

**BIOL 255T. Topics in Botany (1-3; max total 8 if no topic repeated)**  
Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or laboratory)

**BIOL 260T. Topics in Biology (1-3; max total 8 if no topic repeated)**  
Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or laboratory)

**BIOL 265T. Topics in Physiology (1-3; max total 8 if no topic repeated)**  
Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or laboratory)

**BIOL 270T. Topics in Zoology (1-3; max total 8 if no topic repeated)**  
Prerequisite: permission of instructor. Investigation of new fields, areas not in current courses, or advanced studies in a given area. (Lecture and/or laboratory)

**BIOL 274. Biometry (3)**  
Prerequisite: one statistics class, preferably MATH 101. Application of statistical techniques to biological problems with emphasis on sampling, analysis of variance, experimental design, and regression techniques. Emphasis on analysis of real biological data and interpretation of results.

**BIOL 275. Biogeography (3)**  
Prerequisite: permission of instructor. Seminar in descriptive and ecological geography of animal and plant groups.

**BIOL 281. Seminar in Biological Science (1-2; max total 3)**  
Prerequisite: permission of instructor. Reviews and reports on current literature in the various phases of biology.

**BIOL 290. Independent Study (1-3; max total 6)**  
See *Academic Placement—Independent Study*. Approved for *RP* grading.

**BIOL 295. Research (2-6; max total 6)**  
Prerequisite: permission of instructor. Independent research by the graduate student.

**BIOL 299. Thesis (2-4; max total 4)**  
Prerequisite: See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for *RP* grading.

## IN-SERVICE COURSE

(See *Catalog Numbering System*.)

### Biology (BIOL)

**BIOL 302T. Topics in Biology (3; max total 6)**

Prerequisite: graduate standing or permission of instructor. Relation of man to his surroundings; review of concepts, cell, physics and chemistry of life, energetics, inheritance, evolution.

## Moss Landing Marine Laboratories

The California State University began operation of the Moss Landing Marine Laboratories, Moss Landing, California, in the fall semester 1966. This facility functions as a seaside extension of the campuses of seven cooperating state universities (East Bay, Fresno, Monterey Bay, Sacramento, San Francisco, San Jose, and Stanislaus). It offers full-time coursework in marine biology, oceanography, and other marine sciences for majors in either the biological or physical sciences whose objectives include further graduate study, teaching the sciences, or research in the marine sciences. Properly qualified upper-division and graduate students may enroll at the Fresno State campus for a term of instruction at Moss Landing and earn resident credit for such coursework. See *Earth and Environmental Science Department* for on-campus coursework in general oceanography and geology courses related to marine science.

Space reservation is required for attending Moss Landing Marine Laboratories. Forms for this purpose are available from the Biology Department or Moss Landing Marine Laboratories, P.O. Box 223, Moss Landing, CA 95039. Priority is determined based upon the date the space reservation form is received at Moss Landing Marine Laboratories. Since enrollment is limited, interested students should make early application.

## COURSES

**Note:** The following courses are offered at the Moss Landing Marine Laboratories. MSCI 103 and 104 are usually recommended for first semesters of full-time students.

The Biology Department will accept only the following Moss Landing Marine Laboratories courses for major credit as indicated. Botany: MSCI 131, 144. Zoology: MSCI 112, 113, 122, 124, 125. Biology elective: MSCI 103, 104.

\*Late afternoon, Saturday and/or overnight field trips may be required.